

### ***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1, 3, 5-10, 13, 16, 17, 19, 26, 28, 29, 34-38 and 40-44 are pending in the application, with claims 1, 37, and 38 being the independent claims. Claims 1 and 37 were amended as discussed with the Examiner during the Examiner interview of September 16, 2003. Support for the amendment can be found, *inter alia*, at page 5, lines 8-9. Claims 34, 35 and 44 were amended to correct minor typographical errors. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

### ***Examiner Interview***

Applicant's undersigned representative thanks the Examiner for the courteous and helpful telephonic interview conducted on September 16, 2003.

### ***Information Disclosure Statement***

Applicant thanks the Examiner for considering document AP1 cited in the First Supplemental Information Disclosure Statement filed on August 28, 2000, and providing an initialed copy of the corresponding 1449 form. However, Applicant notes that the Examiner

did not provide an initialed copy of the 1449 form accompanying the Second Supplemental Information Disclosure Statement filed on November 21, 2001. Applicant respectfully requests that the Examiner initial the document cited on the 1449 form and return a copy of the initialed 1449 form to Applicant.

***Rejections under 35 U.S.C. § 112, second paragraph***

The Examiner maintained the rejection of claims 1, 3, 5-10, 13, 16, 17, 19, 26, 28, 29, and 34-37 under 35 U.S.C. § 112, second paragraph, for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Paper No. 32, at page 2.) According to the Examiner, "neither Gelfand et al. nor applicants define the 5'-3' exonuclease domain of *Tma* DNA polymerase beyond being at the amino terminal of the *Tma* protein and therefore the claims remain unclear in that the metes and bounds of what is considered to be encompassed by the 5'-3' exonuclease domain is unclear." *Id.* at pages 2-3. Applicant respectfully disagrees.

During the Examiner interview, Applicant's representative pointed out to the Examiner that Gelfand *et al.* teach that the 5'-3' exonuclease domain and the 3'-5' exonuclease domain of *Tma* DNA polymerase together comprise codons 1 to 484 (*see* U.S. Patent No. 5,374,553, col. 13, lines 65-67). Gelfand *et al.* further teach that the 3'-5' exonuclease domain of *Tma* DNA polymerase comprises codons 291-484 and that the 5'-3' exonuclease domain of *Taq* DNA polymerase comprises codons 1 to 289. The Examiner agreed that based on these teachings, it is clear what Applicant considers the "3'-5' exonuclease domain" and the "5'-3' exonuclease domain" of *Tma* DNA polymerase to be.

Since the Examiner agreed that the meets and bounds of the claims are clear, withdrawal of this rejection is respectfully requested.

The Examiner suggested that Applicant amend the specification to include the definition of the 3'-5' exonuclease domain of *Tma* DNA polymerase. (Paper No. 32, at page 3.) Applicant respectfully disagrees. Gelfand *et al.*, U.S. Patent No. 5,374,553, is incorporated by reference into the present application as indicated at page 18, lines 23-25 of the specification. Even if, *arguendo*, the material which is incorporated by reference is considered "essential" by the Examiner, an application for a patent when filed may incorporate "essential material" by reference to a U.S. patent. See M.P.E.P. § 608.01(p)(I) at 600-79 (Feb. 2003). Thus, Applicant submits that it is not necessary to amend the specification to include the definition of the 3'-5' exonuclease domain of *Tma* DNA polymerase.

The Examiner rejected claims 1, 3, 5-10, 13, 16, 17, 19, 26, 28, 29 and 34-37 as being indefinite. (Paper No. 32, at page 4) According to the Examiner, "[i]t is unclear what the difference between a single substitution and a point mutation is and thus the inclusion of both of these types of mutations in the group of specific mutations sought is confusing." *Id.* In an effort to advance prosecution, Applicant has amended claims 1 and 37. The amendment does not change the scope of the claims. As amended, the claims do not recite a point mutation. Thus, this part of the rejection is moot.

The Examiner further argued that

the inclusion of frame shift mutations in the group of sought mutations is unclear as frame shift mutations would result in the [sic] not only the potential loss of 5'-3' exonuclease activity, 3'-5' exonuclease activity and discriminatory behavior against dideoxynucleotides, but the loss in polymerase activity itself, as presumably any domain which

follows the frame shift, as one would read amino-terminal to carboxyl-terminal, would be lost.

Paper No. 32, at page 4. Applicant respectfully disagrees.

As Applicant's representative discussed with the Examiner during the interview, a frameshift mutation would not necessarily lead to loss of activity of the claimed DNA polymerase. For example, a frameshift mutation near the end of the carboxyl-terminal domain may not lead to any loss of 5'-3' exonuclease activity, 3'-5' exonuclease activity, discriminatory behavior against dideoxynucleotides, or polymerase activity. Thus, Applicant submits that the meets and bounds of the claims are clear. Withdrawal of this rejection is respectfully requested.

***Rejections under 35 U.S.C. § 112, first paragraph***

The Examiner maintained the rejection of claims 1, 3, 5-8, 10, 13, 16, 17, 19, 26, 28, 29 and 34-37 under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. (Paper No. 32, at page 5.) The Examiner alleged that "the specification does not disclose a representative number of species of the claimed genus which includes an **infinite number of amino acid variants** of any *Tma* DNA polymerases." (Paper No. 32, at page 10, emphasis in original.)

Applicant respectfully disagrees with the Examiner's reasoning, as well as the Examiner's reasoning laid out at pages 5-10. The Court of Appeals for the Federal Circuit ("Federal Circuit") has provided substantial guidance regarding the written description requirement of 35 U.S.C. § 112 and satisfaction of the "possession test." The Federal Circuit

has instructed that compliance with the written description requirement is to be assessed from the viewpoint of one of ordinary skill in the art. *See Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991) ("the applicant must ... convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention"). The Federal Circuit also has instructed that compliance with the written description requirement does not require a patent specification to describe exactly the claimed subject matter; rather the specification must show the skilled artisan that the applicant invented what is claimed. *See Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989, 997 (Fed. Cir. 2000) ("The written description requirement does not require the applicant 'to describe exactly the subject matter claimed, [instead] the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed'" (citations omitted)). The Federal Circuit also has instructed that "[t]he disclosure rule does not require a particular form of disclosure." *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1321 (Fed. Cir. 2003).

Relative to biotechnology inventions, the Federal Circuit instructed that functional descriptions of biological material can satisfy the written description requirement if a structure/function correlation is known in the art. *See Amgen Inc. v. Hoechst Marion Roussel Inc.*, 314 F.3d 1313, 1332 (Fed. Cir. 2003) ("Eli Lilly did not hold that all functional descriptions of genetic material necessarily fail as a matter of law to meet the written description requirement; rather, the requirement may be satisfied if in the knowledge of the art the disclosed function is sufficiently correlated to a particular, known structure" (citation omitted)). Finally, the Federal Circuit has instructed that a specification that teaches one of skill in the art to make and use an invention can be sufficient to show a person of ordinary

skill in the art that the inventor possessed the invention. *See Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1321 (Fed. Cir. 2003) ("the specification that taught one of skill in the art to make and use an invention also convinced that artisan that the inventor possessed the invention."). Thus, measured according to the Federal Circuit's extensive instructions, Applicant's specification fully supports the currently pending claims. Applicant's specification allows those of skill in the art to recognize that Applicant invented what is claimed.

The Examiner asserted that Applicant's specification does not comply with the written description requirement of § 112 because "the structure/function correlations available for the DNA polymerases are not sufficient to adequately *predict* the genus of polymerases claimed . . . ." (Paper No. 32, at page 9, emphasis added, spelling corrected.) The Federal Circuit has instructed specifically that this line of reasoning simply is not relevant to compliance with the written description requirement of § 112. *See Amgen Inc. v. Hoechst Marion Roussel Inc.*, 314 F.3d 1313, 1332 (Fed. Cir. 2003) ("The written description inquiry . . . focuses on a comparison between the specification and the invention referenced by the terms of the claim – *not comparison between how the product was made as disclosed in the patent and future developments of this process that might alter or even improve how the same product is made.*" (Italics added.) The Examiner has held the specification up to the wrong standard – a standard specifically admonished by the Federal Circuit. It is not the role of the specification to predict all future developments and refinements of the disclosed inventions.

As discussed above, the Federal Circuit has instructed that a specification that teaches one of skill in the art to make and use an invention can be sufficient to show a

person of ordinary skill in the art that the inventor possessed the invention. Thus, in view of the extensive "make and use" teachings in Applicant's specification, persons skilled in the art certainly would recognize that Applicant invented the claimed invention. Rather than reiterate Applicant's previous arguments along these lines, Applicant refers the Examiner to the responses filed on, *inter alia*, May 21, 2001, December 18, 2001, and January 8, 2003.

However, in an effort to advance prosecution, Applicant has amended claims 1 and 37 to indicate that "said [mutant] *Thermotoga maritima* (*Tma*) DNA polymerase has a molecular weight of about 100 kilodaltons." During the Examiner interview, the Examiner indicated that such a limitation may be favorably considered, as it provides additional structural information regarding the size of the resultant *Tma* DNA polymerase mutants. Applicant therefore respectfully requests that the Examiner reconsider this rejection and that it be withdrawn.

***Other Matters***

The allowance of claims 38 and 40-44 is acknowledged and appreciated by Applicant.

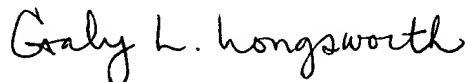
### ***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Date: October 9, 2003

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